

Claims

- [c1] 1. A method for optimizing driver-vehicle performance, comprising:
collecting, on a substantially real-time basis, a plurality of driver and vehicle performance characteristic measurements;
evaluating said plurality of driver and vehicle performance characteristic measurements to predict current driving environment; and
effecting changes in vehicle performance aspects based on said evaluation for potentiating vehicle performance.
- [c2] 2. The method of claim 1, wherein collecting the driver and vehicle performance characteristic measurements further comprises collecting driving data representing a plurality of target categories.
- [c3] 3. The method of claim 2, wherein the target categories further comprise a plurality of vehicle signals, including at least one of acceleration pedal position, gear selection, turn indicator activity, vehicle speed, steering angle, engine speed and brake activity.
- [c4] 4. The method of claim 3, wherein collecting the driving data further comprises collecting driving data from different subjects driving different routes.
- [c5] 5. The method of claim 3, wherein collecting the driving data further comprises annotating the driving data with the target categories by the driver during driving.
- [c6] 6. The method of claim 3, wherein collecting the driving data further comprises collecting data from sensors for tracking at least one of eye and head movements in addition to the vehicle signals.
- [c7] 7. The method of claim 1, further comprising establishing criteria for predicting driving environments differentiable between highway driving, main road driving, suburban driving and city driving.
- [c8] 8. The method of claim 1, further comprising considering at least the following vehicle performance characteristic measurements in said evaluation step, said vehicle performance characteristics including: acceleration pedal position, gear

selection, turn indicator activity, vehicle speed, steering angle, engine speed and brake activity.

- [c9] 9. The method of claim 1, further comprising selecting at least one vehicle performance characteristic measurement to be utilized in the evaluation from the group including: acceleration pedal position, gear selection, turn indicator activity, vehicle speed, steering angle, engine speed and brake activity.
- [c10] 10. The method of claim 9, wherein evaluating said plurality of driver and vehicle performance characteristic measurements further comprises extracting a plurality of features of interest from the vehicle performance characteristic measurements.
- [c11] 11. The method of claim 9, wherein evaluating said plurality of driver and vehicle performance characteristic measurements further comprises averaging each of the vehicle performance characteristic measurements in a pre-processing step over a predetermined time window to obtain a measure for vehicle performance characteristic during the predetermined time window.
- [c12] 12. The method of claim 11, wherein evaluating said plurality of driver and vehicle performance characteristic measurements further comprises classifying the features of interest into categories of driving environment.
- [c13] 13. The method of claim 11, wherein evaluating said plurality of driver and vehicle performance characteristic measurements further comprises calculating a probability of a category of driving environment by a neural network based on the measure for each vehicle performance characteristic during the predetermined time window.
- [c14] 14. The method of claim 13, wherein the category of driving environment further comprises one of a highway driving environment, a main road driving environment, a suburban driving environment, and a city driving environment.
- [c15] 15. The method of claim 1, wherein effecting the changes in vehicle performance aspects further comprises adapting at least one of an engine and a chassis of a vehicle by a vehicle control application based on recognition of a

specific driving environment.

[c16] 16. The method of claim 15, wherein effecting the changes in vehicle performance aspects further comprises effecting real real-time optimization of at least one of an engine parameter and a chassis parameter to the specific driving environment.

[c17] 17. The method of claim 16, wherein the vehicle control application further comprises a workload manager.

[c18] 18. A system for optimizing driver-vehicle performance, comprising:
a plurality of sensing devices for collecting, on a substantially real-time basis, a plurality of driver and vehicle performance characteristic measurements;
a computing device coupled to the sensing devices via a controller area network bus and communication tool for evaluating said plurality of driver and vehicle performance characteristic measurements to predict current driving environment; and
a vehicle control application effecting changes in vehicle performance aspects based on said evaluation for potentiating vehicle performance.

[c19] 19. The system of claim 18, wherein the sensing devices further comprise a plurality of sensing devices for generating a plurality of vehicle signals, including at least one of acceleration pedal position, gear selection, turn indicator activity, vehicle speed, steering angle, engine speed and brake activity.

[c20] 20. The system of claim 19, wherein the computing device further comprises a computer application for preprocessing the vehicle signals to a plurality of input signals for neural network modeling.

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